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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/625,830	07/22/2003	Glenn Houser	FTHL.P0001	8963

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EXAMINER
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ROSENBERGER, RICHARD A

ART UNIT	PAPER NUMBER
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2877

DATE MAILED: 09/26/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

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<b>Office Action Summary</b>	<b>Application No.</b> 10/625,830	<b>Applicant(s)</b> HOUSER, GLENN	
	<b>Examiner</b> Richard A. Rosenberger	<b>Art Unit</b> 2877	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-27 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-27 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |  |
|--|--|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. ____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)            |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>6/15/2004</u> . | 6) <input type="checkbox"/> Other: ____  |

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1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1, 2, 5, 6, 16, 16, 23 and 24 are rejected under 35 U.S.C. 102(b) as being anticipated by Li et al (US 6,392,756).

As in claims 1 and 16, Li et al shows a tunable light source 56 (column 8, lines 42-43) which provides a beam of light incident onto a material 52 to be measured. There is a first detector 60 which detects light reflected from or transmitted through (figures 10, 11 12) the material and a computing device 64 which calculates the thickness based upon the detected light. The sample is clearly held in some manner, and thus has been loaded into a holder as in claim 16, that is , it has been placed into whatever means is holding it/

As in claims 2 and 17, the light source is a tunable laser (column 8, lines 42-43), and as such is a quasi-monochromatic source.

As in claims 5 and 6, the reference discusses detecting light reflected from and transmitted through the material being measured.

As in claim 23, the reference teaches measuring at multiple wavelengths over a range which includes at least ten different wavelengths (“at 1 nm wavelength increments between 190 nm to 900 nm”; column 9, lines 37-38), and as in claim 25, any of these wavelengths can be considered “fixed wavelength points” with adjacent points considered “results obtained by varying the wavelengths”.

4. Claims 3, 4, and 18-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Li et al (US 6,392,756).

See above.

As for claims 3 and 18, the reference does not specifically teach what type of detector can be used. It would have been obvious to use any known and commercially available detector for the detector of the reference; photodiodes are such known and commercially available detectors, a fact that is so well known official notice is sufficient.

As for claim 4 and 19, the reference teaches a large number of spaced data points; those in the art could choose other spacing of the wavelengths used to make the measurements because the exact spacing are not critical, and would not be believed to be critical, to the technique of the reference.

As for claim 7, the reference teaches that the light should be directed onto the sample at an angle near –normal incidence (column 6, lines 31-32); while the reference does not

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specifically quantify “near-normal”, it is clear that the instant claims “less than  $\pm 5^\circ$  from normal” is within the disclosure of the reference, and would have been for that reason at least obvious.

As for claims 20, it would have been obvious to use the technique of the reference to measure other thin film thicknesses than the particular thicknesses discussed in the reference; the technique is, and would have been recognized as, a more general technique applicable to other thicknesses.

As for claim 21, it would have been obvious to make the thickness measurement as accurate as needed or desired for the application at hand. The reference teaches the film thickness can be measured “to within an accuracy of 3 Angstroms or less”, if the film being measured has a thickness of more than 300 Angstroms (30 nm, 0.03  $\mu\text{m}$ ), then this accuracy would be the claimed less than 1%.

As for claim 22, the reference does not disclose the size of the light spot on the film being measured; it would have been obvious to make the light spot small, including the “less than 200  $\mu\text{m}$ ” of the claim because a small light spot would make a measurement of a small area and would thus be more accurate by minimizing the problem of the film possibly having different thicknesses at different locations which would degrade a measurement over a larger area.

5. Claims 8-15 and 25-27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Li et al (US 6,392,756) in view of Quick et al (6,025,916).

See above.

As for claims 8 and 25, it is known in the art that a more accurate measurement can be made by using a beam splitter to obtain a reference beam to obtain a reference value to correct

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the measurement for possible changes in the intensity of the light source; this is shown, for example, by Quick et al; see reference detector 52 and column 4, lines 22-25.

As in claims 9-12 the use of appropriate lenses and known circuitry, such as current to voltage converters (claim 11) and A/D converters (claims 12) would have been obvious because such circuit elements are so well known in the art that official notice is sufficient.

As for claims 26 and 27, the Li et al reference discusses the use of theoretical models in the calculation of the thickness (column 11, lines 32-43).

6. Claims 13-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Li et al (US 6,392,756) and Quick et al (US 6,025,916), as applied to claims 12 above, and further in view of Ruhl, Jr., et al (US 5,357,336).

In order for the technique of Li et al to be highly accurate, it is necessary to know with precision the wavelengths of the light at the various measuring points. It is known in the art, as shown by Ruhl et al, to use an etalon to calibrate the wavelength of a light source; as those in the art would have realized that there is a need for accuracy in the knowledge of the wavelengths of the instrument of Li et al, it would have been obvious to include a known wavelength calibration systems, such as an etalon-based system such as shown by Ruhl et al.

7. Adams (US 4,899,055), Zurasky (US 3,737,237) and Kikkawa et al (US 4,676,647) shows similar systems. Note the reference detector 32 of Adams and the A/D converter 18 of Kikkawa et al. Note also that both Adams and Kikkawa et al shows lenses in the light path.

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8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Richard A Rosenberger whose telephone number is (571) 272-2428. The examiner can normally be reached on Monday through Friday during the hours of 8:00-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gregory J. Toatley, Jr. can be reached on (571) 272-2800 ext. 77. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

R. A. Rosenberger  
19 September 2005



Richard A. Rosenberger  
Primary Examiner